

## CLAIMS

1) A method for packing and filtering geophysical events readable on several sets of available geophysical records, obtained by exploration of an underground zone, characterized in that it comprises :

- 5 - distributing these geophysical events into a certain number  $p$  of families of geophysical variables having each a particular physical significance,
- forming, by combination of said seismic variables, synthetic variables in much fewer number than the number of said variables, which are obtained by construction of an orthogonal vector base in each one of the  $p$  analysis sets consisting of the data of each
- 10 one of said families, wherefrom is derived the formation of an orthonormal vector base describing the  $p$  analysis sets, and
- using this orthonormal vector base for filtering and describing said geophysical events.

2) A method as claimed in claim 1, characterized in that formation of the synthetic variables is obtained by combining a principal component analysis technique or derived

15 norm diagonalization methods and a simple regression technique.

3) A method as claimed in claim 1 and 2, characterized in that the synthetic variables are subjected to a rotation so as to improve correlations between initial variables and synthetic variables.

4) A method as claimed in claim 1, 2 or 3, characterized in that synthetic variables

20 are formed from families consisting of seismic trace cubes obtained after a 3D seismic survey, each one corresponding to the same offset.

5) A method as claimed in claim 1, 2 or 3, characterized in that synthetic variables are formed from families consisting of seismic trace cubes obtained after a 3D seismic survey, each one corresponding to the same angle of incidence.

6) A method as claimed in claim 1, 2 or 3, characterized in that synthetic variables  
5 are formed from families consisting of seismic attribute cubes obtained by processing seismic trace amplitudes obtained after a 3D seismic survey.

7) A method as claimed in any one of the previous claims, characterized in that synthetic variables are formed from families consisting of seismic trace cubes obtained by successive seismic explorations in the zone.

10 8) A method as claimed in any one of the previous claims, characterized in that synthetic variables are formed from families consisting of seismic attribute cubes formed by processing seismic trace amplitudes obtained by successive seismic explorations in the zone.

9) A method as claimed in claim 1, 2 or 3, characterized in that synthetic variables  
15 are formed from families consisting of log attribute measurements of different physical nature.

10) A method as claimed in claim 9, characterized in that synthetic variables are formed from resistivity measurement families.

11) A method as claimed in claim 9, characterized in that synthetic variables are  
20 formed from families of measurements linked with the formation radioactivity.

12) A method as claimed in claim 9, characterized in that synthetic variables are formed from families of measurements linked with the formation porosity.